The effects of payroll tax reduction on employment stability: evidence from Spain.

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Abstract

The aim of this study is to analyze the effects of payroll tax reductions that promote permanent contracts as opposed to fixed-term to increase job stability. Traditionally, the effects are studied from the point of view of worker characteristics. However our perspective is that the characteristics of firms may have an influence on the effects of payroll tax reduction on job stability. The data used come from the 2005 Continuous Work History Sample (CWHS). The database includes administrative records from the Social Security system with the entire labor history of 1.2 million people (around 4% of all affiliated workers) and some information about the firms such as economic sector, size, legal status, tenure, region, public or private ownership or national or international capital. We find out a positive effect of payroll tax reduced contracts on the probability to remain employed during the year after the contract have been signed, that turns negative in the following years. Consequently, the effects of payroll tax reduction are positive in the short term but negative in a longer term.

The effects of payroll tax reduction on employment stability: evidence from Spain.

The Spanish labor market is characterized by its high rate of fixed-term contracts. Since 2001, the Spanish government has been implementing some employment subsidies and payroll tax reductions in order to promote the hiring of workers on a permanent basis and the conversions of contracts from temporary to permanent in an attempt to reduce the excessive number of fixed-term ones. Even though, hiring and dismissal cost have had a small impact and employment instability in Spain remains very high**,** being the country in the EU with the second highest rate of temporary employment, 25.4%, only surpassed by Poland.

Some empirical papers analyze the effects of these measures on workers´ wages and contract tenure from the perspective of workers characteristics. In our paper, we focus on the characteristics of the firms as the key point to evaluate the impact of payroll tax reduction on labor stability. We measure the effects of payroll tax reductions on employment stability by using the propensity score matching (PSM) technique. PSM reduces the bias that could be found in an estimate of the treatment effect obtained from simply comparing outcomes among companies that received payroll tax reductions versus those who did not. When there is a lack of randomization on the allocation of tax reductions to companies, casual inferences cannot be made because it is not possible to determine whether the difference in outcome between the treated and control companies is due to the policy or to differences between companies on other characteristics. The PSM ensures that any differences between the treatment and the control groups are not a result of differences on the matching variables. For this paper different matching methods have been used to analyze the consistency of the results and to test the sensitivity of estimated treatment effects with respect to unobserved heterogeneity.

We have used data from the Continuous Work History Sample (CWHS), which includes employment records from the Social Security system for about 1.2 million people (around 4% of all affiliated workers). The CWHS is designed to be representative of the Spanish labor market, and contains very detail information of labor force status of individuals. This data also contains information about the firms such as the economic

sector, size, legal status, tenure, region or if public or private ownership. We can observe the dynamic evolution of different occupied vacancies from 2002 to 2006 and whether or not companies benefit form payroll tax reduction by hiring a worker on a permanent basis or transforming a contract form temporary to permanent basis.

The effect of the policy is evaluated in terms of tenure, therefore, if the labor relationship remains "alive" in the following years. The results show that subsidized contracts have higher survival rates only during the first year after being signed. This positive differential becomes negative in the second and following years. Since the negative effect more than offsets the initial positive, we can conclude that workers with subsidized permanent contracts are more likely to leave the company than other workers hired on a permanent basis. It seems that the presence of administrative penalties associated with non-compliance with the requirements for subsidized contracts are the reason of the results during the first period.

1. Introduction.

From the mid 1980's, the labor market in Spain has been characterized by a significant increase on the rate of temporary contracts. Different governments have encouraged some types of employment subsidies or payroll tax reductions in order to promote permanent contracts and to reduce the excessive number of fixed-term ones. This payroll tax reductions may affect to the employee's wage and tenure, so that empirical papers have analyzed the effects of this policy taking into account the workers characteristics. In this paper we consider the firm characteristics as an important aspect to obtain the impact of those reductions.

In the 1980's the Spanish unemployment rate was the highest in the OECD countries. To reduce it, temporary contracts were encouraged in the several reforms of the labor market. The first reform in 1984 of the Workers' Statute of 1980 means an inflection point to temporality, in that firms will not be obliged since then to give legal reasons for the temporary contracts. The consequence of the successive reforms of 1992, 1994, 1995 was that the percentage of temporary contracts grew significantly, reaching the 30%. In 2006 the rate of unemployment is under 10% for first time since 1979, but the

high rate of temporarily menaces to become a big problem in that it accounts for more the double of the average in the European Union. Already in 2001 the growing trend of temporarily provoked the Spanish Government's decision to give some impetus to the permanent contracts. To accomplish the goal, a kind of measures were implemented in a labor market reform, such as the reduction of firing costs and some payroll tax reductions (PTR), that were initially designed to favor certain groups with difficulties in finding jobs. Nevertheless, the high rates of temporality continued and as a consequence the following reforms extended PTR to all types of workers.

The access to PTR has not been homogeneous within firms and this access may be depending on the characteristics of these firms. Additionally, firms decide eventually the type of contract the worker will sign because it has a higher bargaining power due to the big rate of unemployment in Spain.

The main goal of this paper is to study if the firms' contract decisions have some consequences on the tenure of the occupation. This is essential in determining whether the contract with PTR is an intermediate step to a usual contract or it represents a new labor situation that implies the presence of a new category of worker in the Spanish labor market.

To accomplish this objective, the paper is organized as follows. The second part is devoted to the methodological issues; the third part offers some descriptive analysis of the database; the fourth one shows the main results; and the last one is dedicated to conclusions.

2. Methodology: **the problem** of the control group and the matching process.

Some employment policies have effects on the beneficiaries since they change workers employment history. These effects of the policies, which at first glance seem obvious, are not easy to demonstrate because they are distorted by the "unobservable variable" problem. This problem implies that it is not possible to compare the situation in a given period of time, after being the beneficiary of an active labor policy, with what would have happened if that worker had not participated in the policy. This problem is independent of the chosen indicator to measure the effect of the policy.

A second difficulty on evaluating the effects of policies is the so called "selection bias". The selection bias problem implies that factors that determine a firm's participation in a particular labor policy, such a PTR contract, may be the same that influence its decision as to maintain a given job occupied by an individual worker. In this case it is not easy to calculate the pure effect of the policy.

The correct measure of the impact of a particular labor policy must overcome these two difficulties. There are several approaches to address the question trying to obtain the control group, non-treated firms or firms that have not accessed to the economic policy, to compare them with participant companies. Then if the non-treated and the treated companies are homogeneous, evolution of some indicator can show the effect of the policy. The used method must let us to find a group of companies that have not participated in economic policy with the same characteristics as those that do have participated. The correct identification of the control group overcomes the two problems.

Being D = 1 that a contract has been a beneficiary of a PTR and the result is Y^1, while D = 0 indicates that the contract is within PTR and , Y^0 is what would be happen in this case, the impact or effect would be the difference between the two values of the variable

$$Y = D\,Y^1 + (1 - D)\,Y^0 \qquad (1)$$

we are only able to observe truth Y value, depending on the value of D, but not both at once. In equation form, the expected value of the effect of a particular policy is:

$$E(\Delta / D = 1) = E(Y^1 / D = 1) - E(Y^0 / D = 1) \qquad (2)$$

That represents the difference between what is actually expected if carried out "treatment" and what would be expected if it is not.

If a contractual relationship benefits from a policy, we observe the first component of equation (2) but the second is not observed, but it can be estimated by some statistical techniques that can be classified into three groups. A first group considers all contracts not subject to the policy as the reference group, the difference-in-difference approach (Kluve et al. (2003) y Heckman et al (1979)). A second group of techniques, heckprobit (Heckman (1979), Malo et al. (2004) y Malo et al. (2006)) correct a priori the selection bias. Finally, the used method in this work (Sianesi (2004) y Leuven y Sianesi (2003))

is the matching approach, and it is based in the efficiency selection of the control group that we briefly explain.

Propensity score-matching methods correct for sample selection bias due to observable differences between the treatment and comparison groups. Matching involves pairing treatment and comparison units that are similar in terms of their observable characteristics. When the relevant differences between any two units are captured in the observable (pretreatment) covariates, which occurs when outcomes are independent of assignment to treatment conditional on pretreatment covariates, matching methods can yield an unbiased estimate of the treatment impact. But selecting a subset of comparison units similar to the treatment units is difficult because units must be compared across a high-dimensional set of pretreatment characteristics (*X*):

$$E(Y^0 \mid X, D = 0) = E(Y^0 \mid X, D = 1) \tag{3}$$

Therefore, the first step is the estimation of the propensity score that is the probability that a particular firm benefits form a payroll tax reduction. This probability depends on the firms characteristics such as size, geographical location or economic sector, and it can be expressed as:

$$D = \gamma Z + u_2 \tag{4}$$

Where D is the probability to be treated, Z is the vector of firm characteristics and ɣ is the influence of each characteristic on the probability. From the previous results each treated firms can be matched with a non-treated one that has the similar propensity score and consequently similar characteristics. Then the evaluation of the PTR contract is done comparing both groups of firms.

There are several procedures based on the “distance” between the propensity score of each treated firm and the rest of non-treated firms. As it is done in Sianesi (2004), Leuven y Sianesi (2003) and Malo y Muñoz-Bullón (2006), we define a threshold or maximum distance and the closest non treated firm is chosen as control of each treated one.

Finally we select the variable that it is going to measure the impact of the PTR contracts. The database (WCHS) let us to use tenure as relevant indicator. That it is to say, we are interested in analyze if PTR contracts duration is longer that “traditional”

contracts. This indicator is really adequate because the objective of the program is to promote job stability and to reduce the number of fixed-term.

3. Data base and some descriptive analysis.

3.1. CWHS and variables.

We have used data from the CWHS survey for the period 2002 to 2006. The CWHS is yearly elaborated by the Spanish Ministry of Employment and Social Security. In 2001 Spanish Government began the promotion of PTR contracts that were implemented in the beginning of 2002, consequently, we look for information about the labor situation of these contracts in 2003, 2004, 2005 and 2006, so that the policy can be evaluated in terms of tenure; that it is to say, if the labor relationship was "alive" in the following years. We test the effects for 2002 and the next four years, as well as for 2003 and the period 2004-2006.

As it can be seen in table 1, the number of PTR contracts in 2002 was 12.977, which is significant from a statistical point of view. 8.538 of them were new contracts in that year, while 4.439 were transformed from fixed-term ones into non-fixed-term ones. The total amount of PTR contracts in 2002 accounts for almost the 20% of the whole non-fixed-term contracts. In 2003 there is a reduction in the number of contracts for almost every category, but the figures are clear; in that year the contracts with PTR accounts for 24% of total.

Table.1. Number and type of permanent contracts

	Type of contracts	Number of contracts	%
2002	Initial Regular	52.876	77,98
	Transformed with PTR	4.439	6,55
	Initial with PTR	8.538	12,59
	Transformed without PTR	1.956	2,88
	Total	67.809	
2003	Initial Regular	29.268	67,58
	Transformed with PTR	3.705	8,55
	Initial with PTR	6.659	15,38
	Transformed without PTR	3.678	8,49

Total	43.310

Below in table 2 we describe the variables used in the study.

Table 2. Variables:

Regions	REG1	Andalucía
	REG2	Aragón
	REG3	Canarias
	REG4	Cantabria
	REG5	Castilla y León
	REG6	Castilla-La Mancha
	REG7	Cataluña
	REG8	Madrid
	REG9	Navarra
	REG10	Valencia
	REG11	Extremadura
	REG12	Galicia
	REG13	Islas Baleares
	REG14	La Rioja
	REG15	País Vasco
	REG16	Asturias
	REG17	Región de Murcia
	REG18	Ceuta
	REG19	Melilla
Economic Activity	ACTIV1	Agriculture
	ACTIV2	Extractive industries
	ACTIV3	Manufactures of Wood and cork
	ACTIV4	Electrical equipments and construction
	ACTIV5	Electricity, gas and water
	ACTIV6	Trade and repair of vehicles
	ACTIV7	Transport, Storage and Communication
	ACTIV8	Real estate, renting and business activities
	ACTIV9	Education
	ACTIV10	Other social and services activities
Type of firm	TYPE1	Corporations
	TYPE2	Limited liability company
	TYPE3	General partnership
	TYPE4	Limited partnership with a share capital
	TYPE5	Community Ownership
	TYPE6	Cooperatives
	TYPE7	Associations

	TYPE8	Co-ownership Horizontal property
	TYPE9	Foreign Firm
	TYPE10	Institutions
	TYPE11	Other Social Activities and Services
Employees	Number of workers	
inicioactiv	Initial year of activity	
ETT	Temp Recruitment Agency	

The first set refers to the nineteen administrative regions in Spain. Secondly, we include ten economic sectors ranging from Agriculture, Trade, to Education or Other Social Activities. Eleven types of firms stand for the third set of variables. Finally, the number of workers, year of starting the activity and a dummy variable indicating if the firm is a temp recruitment agency or not close the list.

3.2. Control and treated groups.

In tables 3, 4 and 5 the "propensity score" results are presented. The reference firm is located in Andalucía, which is a corporation and belong to agricultural sector. We include firm size and tenure as explanatory variables; a dummy is introduced when the firm is a temp recruitment agency.

The propensity score is calculated for a non-fixed-term job contract with tax reduction in the first quarter of 2002 and 2003. Later the matching process is implemented to calculate the probability of continuing working in the same firm in the following years.

From an empirical point of view, the first step is to estimate the probability for a company to hire a worker with payroll tax reduction. Using the CWHS database, the endogenous variable is 1 when the non-fixed-term contract has a tax reduction and 0 in other case. Then we can estimate the "propensity score" that will allow us to determine the control group as the set of non-subsidized contracts for which the company has similar characteristics to those that opted for PTR contracts.

The two groups, treated and non-treated firms, allow us to compare the tenure or duration of the labor relationship. We apply the procedure in the first quarter of two years, 2002 and 2003, and we analyze the tenure until 2006 for both samples.

Table 3. Characteristics of the treated and non treated groups, before and after the matching process. Permanent contracts, year 2002.

	Non matched sample				Matched sample			Bias reduction
	Treated	Control	Diff		Treated	Control	Diff	
REG1	9,4%	11,0%	-1,6%	**	9,6%	9,4%	0,2%	87,5
REG2	3,7%	3,8%	-0,1%		3,8%	3,3%	0,4%	-485,9
REG3	3,2%	3,9%	-0,7%	**	3,3%	3,5%	-0,2%	72,6
REG4	1,0%	1,2%	-0,2%	**	1,0%	1,0%	0,0%	96,2
REG5	4,6%	5,2%	-0,6%	**	4,7%	4,6%	0,1%	79,7
REG6	3,7%	3,6%	0,1%		3,7%	3,9%	-0,2%	-260,9
REG7	23,4%	22,2%	1,2%	**	23,6%	24,4%	-0,8%	33,4
REG8	17,4%	20,1%	-2,7%	**	17,8%	18,2%	-0,5%	81,6
REG9	2,2%	2,0%	0,2%		2,1%	1,9%	0,2%	7,2
REG10	12,8%	9,9%	2,9%	**	12,3%	12,5%	-0,1%	95,7
REG11	1,2%	1,6%	-0,5%	**	1,2%	1,3%	-0,1%	86,4
REG12	5,0%	4,0%	0,9%	**	4,7%	4,4%	0,3%	66,7
REG13	1,7%	1,7%	-0,1%		1,7%	1,7%	0,0%	100,0
REG14	0,9%	0,9%	0,0%		0,9%	1,0%	-0,1%	-1492,4
REG15	5,6%	5,0%	0,7%	**	5,4%	5,1%	0,3%	50,6
REG16	1,9%	1,7%	0,2%		1,9%	1,6%	0,3%	-73,0
REG17	2,3%	1,9%	0,4%	**	2,2%	2,1%	0,1%	72,9
REG18	0,1%	0,1%	-0,1%	**	0,1%	0,1%	0,0%	79,0
ACTIV1	2,3%	5,6%	-3,3%	**	2,3%	2,5%	-0,2%	94,6
ACTIV2	7,2%	7,0%	0,2%		7,4%	7,1%	0,2%	-17,6
ACTIV3	14,5%	15,8%	-1,3%	**	14,7%	14,7%	0,1%	95,8
ACTIV4	6,7%	9,0%	-2,3%	**	6,8%	6,2%	0,6%	73,4
ACTIV5	8,7%	6,6%	2,1%	**	8,8%	8,8%	0,1%	95,9
ACTIV6	30,5%	19,9%	10,6%	**	30,0%	30,9%	-0,9%	91,4
ACTIV7	6,6%	12,0%	-5,4%	**	6,7%	6,3%	0,5%	91,5
ACTIV8	13,7%	15,2%	-1,6%	**	13,9%	14,2%	-0,3%	82,9
ACTIV9	4,5%	5,2%	-0,7%	**	4,3%	4,3%	0,0%	100,0
ACTIV10	5,5%	3,7%	1,8%	**	5,0%	5,1%	-0,1%	94,8
TYPE1	36,7%	47,4%	-10,7%	**	37,4%	38,5%	-1,1%	90,1
TYPE2	45,7%	31,7%	13,9%	**	46,6%	45,6%	0,9%	93,2
TYPE3	0,0%	0,0%	0,0%		0,0%	0,0%	0,0%	-68,3
TYPE4	0,0%	0,1%	0,0%		0,0%	0,0%	0,0%	100,0
TYPE5	1,2%	1,1%	0,1%		1,2%	1,1%	0,2%	-22,9
TYPE6	1,1%	1,5%	-0,4%	**	1,1%	1,0%	0,1%	66,5
TYPE7	3,8%	4,5%	-0,7%	**	3,8%	3,7%	0,1%	84,0
TYPE8	0,2%	0,1%	0,1%	**	0,1%	0,1%	0,0%	92,0
TYPE9	0,1%	0,2%	-0,1%	**	0,1%	0,1%	0,0%	93,8
TYPE10	1,2%	7,9%	-6,7%	**	1,2%	1,1%	0,1%	99,2
TYPE11	10,2%	5,6%	4,5%	**	8,4%	8,8%	-0,4%	91,9

Employees	275,93	559,52	-283,6	*	281,5	294,67	-13,2	95,4
inicioactiv	1990,1	1983	7,1	**	1990	1989,7	0,3	96,0
ETT	0,1%	0,1%	0,0%		0,1%	0,1%	0,0%	75,1

Table 4. Characteristics of the treated and non treated groups, before and after the matching process. Initial permanent contracts, year 2002.

	Non matched sample				Matched sample				Bias reduction
	Treated	Control	Diff		Treated	Control	Diff		
REG1	9,8%	11,0%	-1,2%	**	10,0%	10,0%	-0,1%		95,2
REG2	3,5%	3,8%	-0,3%		3,5%	3,3%	0,2%		38,0
REG3	3,4%	3,8%	-0,4%		3,5%	3,5%	0,0%		91,0
REG4	1,0%	1,2%	-0,2%		1,0%	0,9%	0,1%		74,9
REG5	4,5%	5,2%	-0,8%	**	4,6%	4,3%	0,3%		63,5
REG6	3,6%	3,6%	0,0%		3,7%	4,1%	-0,4%		70483,6
REG7	21,9%	22,2%	-0,4%		22,3%	22,9%	-0,6%		-61,1
REG8	18,9%	20,2%	-1,3%	**	19,3%	19,4%	-0,2%		86,0
REG9	2,0%	2,0%	0,1%		1,9%	1,8%	0,1%		-17,4
REG10	12,6%	9,8%	2,8%	**	11,9%	12,1%	-0,3%		91,0
REG11	1,3%	1,6%	-0,3%	**	1,3%	1,5%	-0,2%		46,6
REG12	5,3%	4,1%	1,2%	**	4,8%	4,5%	0,3%		74,3
REG13	1,8%	1,7%	0,0%		1,8%	1,8%	0,0%		2,2
REG14	0,9%	0,9%	0,0%		1,0%	0,9%	0,1%		-170,1
REG15	5,4%	5,0%	0,4%		5,3%	5,1%	0,3%		32,8
REG16	2,0%	1,8%	0,3%		2,0%	1,6%	0,4%		-62,4
REG17	2,1%	1,9%	0,2%		2,1%	2,1%	0,0%		94,9
REG18	0,1%	0,2%	-0,1%		0,1%	0,1%	0,0%		84,9
ACTIV1	1,9%	5,7%	-3,8%	**	1,9%	2,1%	-0,2%		94,9
ACTIV2	7,5%	7,1%	0,4%		7,6%	7,3%	0,3%		18,5
ACTIV3	10,4%	15,9%	-5,5%	**	10,6%	10,1%	0,5%		91,4
ACTIV4	5,2%	9,1%	-3,9%	**	5,3%	4,8%	0,5%		87,0
ACTIV5	8,5%	6,5%	2,0%	**	8,6%	8,6%	0,0%		98,2
ACTIV6	33,8%	19,4%	14,3%	**	33,2%	34,7%	-1,4%	**	90,0
ACTIV7	7,1%	12,0%	-5,0%	**	7,2%	6,7%	0,5%		90,4
ACTIV8	14,5%	15,3%	-0,8%		14,8%	15,5%	-0,6%		18,4
ACTIV9	5,0%	5,2%	-0,2%		4,9%	4,8%	0,0%		89,9
ACTIV10	6,3%	3,7%	2,6%	**	5,8%	5,4%	0,5%		82,7
TYPE1	31,3%	47,8%	-16,4%	**	32,0%	33,1%	-1,1%		93,0
TYPE2	47,7%	31,2%	16,5%	**	48,7%	47,9%	0,8%		95,2
TYPE3	0,0%	0,0%	0,0%		0,0%	0,0%	0,0%		100,0
TYPE4	0,0%	0,0%	0,0%		0,0%	0,0%	0,0%		100,0
TYPE5	1,5%	1,1%	0,4%	**	1,5%	1,4%	0,1%		75,9
TYPE6	1,0%	1,5%	-0,5%	**	1,1%	0,8%	0,3%		41,4

TYPE7	4,2%	4,4%	-0,3%		4,3%	4,1%	0,1%	54,9
TYPE8	0,2%	0,1%	0,2%	**	0,2%	0,2%	0,0%	93,1
TYPE9	0,1%	0,2%	-0,2%	**	0,1%	0,0%	0,0%	84,0
TYPE10	1,1%	8,1%	-7,0%	**	1,2%	1,2%	0,0%	99,7
TYPE11	12,8%	5,5%	7,3%	**	11,1%	11,2%	-0,1%	98,2
Employees	250,59	570,03	-319,4	**	255,63	266,36	-10,7	96,6
inicioactiv	1990,6	1982,7	7,9	**	1990,6	1989,9	0,7	92,2
ETT	0,1%	0,1%	0,1%		0,1%	0,2%	-0,1%	5,0

Table 5. Characteristics of the treated and non treated groups, before and after the matching process. Transformed contracts, year 2002.

	Non matched sample				Matched sample			Bias reduction
	Treated	Control	Diff		Treated	Control	Diff	
REG1	11,3%	8,6%	2,7%	**	11,4%	11,6%	-0,2%	92,2
REG2	4,1%	4,3%	-0,2%		4,2%	4,2%	0,0%	100,0
REG3	6,8%	2,7%	4,0%	**	5,7%	5,7%	-0,1%	98,7
REG4	1,3%	1,1%	0,3%		1,2%	1,3%	-0,1%	61,4
REG5	4,1%	4,9%	-0,8%		4,2%	4,1%	0,1%	93,3
REG6	3,3%	3,7%	-0,4%		3,4%	3,9%	-0,5%	-25,1
REG7	20,3%	26,3%	-6,0%	**	20,5%	20,0%	0,5%	92,2
REG8	17,7%	14,5%	3,2%	**	18,1%	17,0%	1,0%	67,5
REG9	2,2%	2,5%	-0,3%		2,2%	2,2%	0,0%	100,0
REG10	12,0%	13,1%	-1,2%		12,1%	12,9%	-0,8%	33,3
REG11	1,3%	0,9%	0,4%		1,4%	1,6%	-0,2%	51,2
REG12	3,8%	4,5%	-0,7%		3,8%	3,4%	0,4%	38,4
REG13	2,7%	1,5%	1,2%	**	2,6%	2,6%	-0,1%	95,7
REG14	1,0%	0,9%	0,2%		1,0%	1,2%	-0,2%	5,9
REG15	3,5%	6,1%	-2,6%	**	3,5%	3,7%	-0,1%	96,0
REG16	1,7%	1,7%	0,0%		1,7%	1,9%	-0,2%	-726,0
REG17	2,9%	2,6%	0,3%		3,0%	2,6%	0,4%	-50,1
REG18	0,0%	0,0%	0,0%		0,0%	0,0%	0,0%	,
ACTIV1	3,9%	3,0%	0,9%	**	4,0%	3,6%	0,4%	60,9
ACTIV2	5,4%	6,8%	-1,5%	**	5,5%	4,7%	0,7%	49,9
ACTIV3	10,8%	22,3%	-11,5%	**	11,1%	12,1%	-1,0%	91,3
ACTIV4	4,2%	9,5%	-5,3%	**	4,3%	4,0%	0,3%	95,1
ACTIV5	8,3%	9,0%	-0,7%		8,5%	7,8%	0,7%	3,4
ACTIV6	33,9%	24,2%	9,7%	**	34,2%	36,0%	-1,8%	81,2
ACTIV7	11,6%	5,7%	5,9%	**	10,7%	10,6%	0,1%	99,1
ACTIV8	12,3%	12,0%	0,3%		12,2%	11,5%	0,7%	-138,8
ACTIV9	4,5%	3,5%	0,9%		4,5%	4,7%	-0,2%	77,6
ACTIV10	5,2%	4,0%	1,1%	**	5,1%	4,9%	0,2%	81,5
TYPE1	36,9%	47,0%	-10,0%	**	37,5%	38,1%	-0,6%	94,3

TYPE2	46,7%	41,8%	4,9%	**	47,0%	47,4%	-0,5%	90,3
TYPE3	0,1%	0,0%	0,1%		0,0%	0,1%	-0,1%	34,6
TYPE4	0,0%	0,0%	0,0%		0,0%	0,0%	0,0%	,
TYPE5	0,7%	0,7%	0,0%		0,7%	0,5%	0,2%	-1282,8
TYPE6	1,5%	1,2%	0,4%		1,5%	1,0%	0,5%	-29,7
TYPE7	4,6%	3,0%	1,6%	**	4,5%	3,9%	0,6%	60,8
TYPE8	0,2%	0,0%	0,1%		0,0%	0,0%	0,0%	100,0
TYPE9	0,0%	0,0%	0,0%		0,0%	0,0%	0,0%	,
TYPE10	0,6%	1,2%	-0,6%	**	0,6%	0,7%	-0,1%	91,7
TYPE11	8,8%	5,2%	3,6%	**	8,1%	8,2%	-0,1%	97,1
Employees	275,45	325,62	-50,2		280,12	209,22	70,9	-41,3
inicioactiv	1991,3	1989	2,3	**	1991,2	1992,1	-0,9	62,8
ETT	0,3%	0,1%	0,2%	**	0,0%	0,2%	-0,2%	16,8

4. Effect of the payroll tax reduction in contracts on tenure.

After analyzing the influence of firm characteristics on the probability to use subsidize permanent contracts, we have implemented the process of matching and calculated the difference in the survival function. The first step is the matching, that it is to say, we choose for each contract with tax reduction a similar one without tax reduction for each and every one of the firm characteristics. Thus the treated and the control group are made up.

In the second step we define the gauge used to analyze the impact of the policy on workers. The data used allow us to know whether the worker continues in the same firm one, two, three or four years later. The differences on the probability of continuing in the same firm between treated and control groups are going to be the indicator used in this paper. They are all listed in table 6 for 2002. In figure 4.1 the tenure functions are drawn, for the total contracts, the new initial and the transformed ones in 2002.

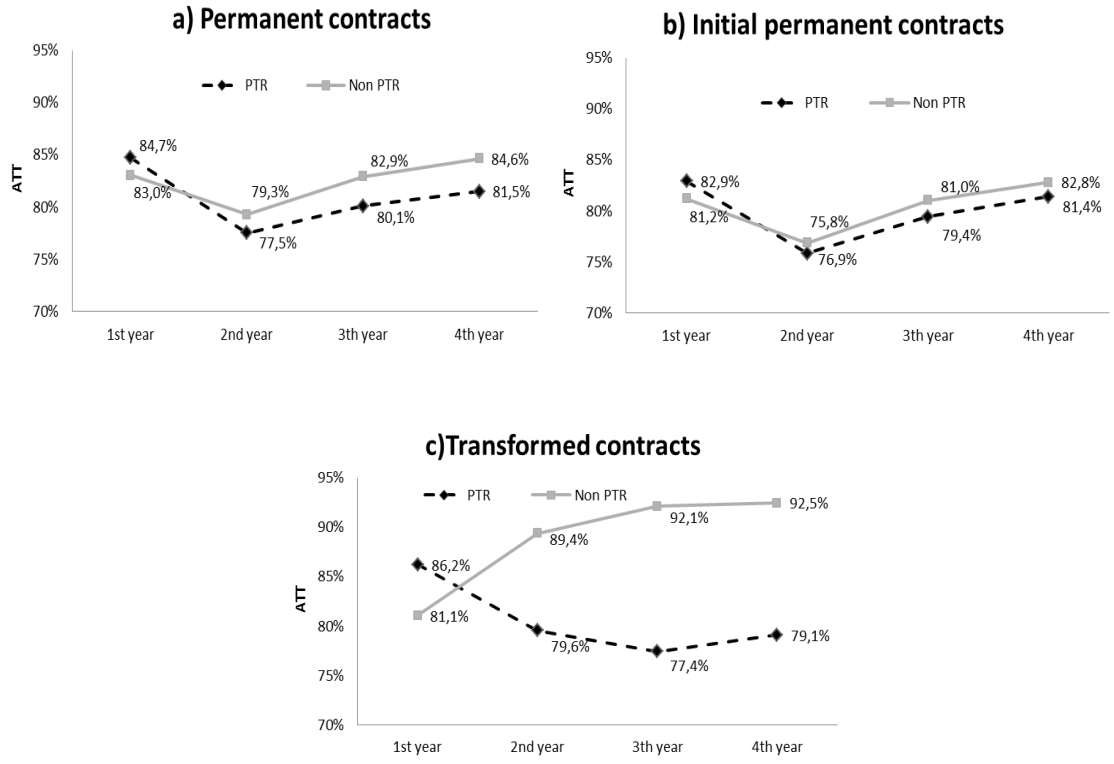
Table 6. Average treatment effect over time, 2002

		PTR	Non PTR	Difference	
All contracts	1st year	84,7%	83,0%	0,0169	***
	2nd year	77,5%	79,3%	-0,0174	***
	3th year	80,1%	82,9%	-0,0280	***
	4th year	81,5%	84,6%	-0,0316	***
Initial	1st year	82,9%	81,2%	0,0171	***

	2nd year	75,8%	76,9%	-0,0104	
	3th year	79,4%	81,0%	-0,0160	***
	4th year	81,4%	82,8%	-0,0142	**
Transformed	1st year	86,2%	81,1%	0,0517	***
	2nd year	79,6%	89,4%	-0,0980	***
	3th year	77,4%	92,1%	-0,1469	***
	4th year	79,1%	92,5%	-0,1335	***

The first result is that the differences in tenure between treated and control groups are significant in most of the cases. Consequently, the conclusion is that the permanence in the firm depends on the kind of contract. When we take into account all contracts, the probability of staying hired in the same firm is higher for the subsidized contracts only the first year. Thereafter, the probability or tenure decreases and goes under the values corresponding to the contracts without PTR. This is true for the initial permanent contracts and the transformed one as well. In figure 1 c) it is shown that the difference between the treated and the non-treated group is much bigger for those contracts that have been transformed from temporary to non-fixed-term ones.

Figure 1. Average treatment effect over time, 2002



The presence of administrative penalties associated with non-compliance with the requirements for subsidized contracts is the reason of the results in the first period.

The tenure functions in figure 1 exhibit a growing path for treated and control groups after the second year attending to the total (a) and the new initial contracts (b). Therefore the duration of the labor relationship reduces the probability of leaving the occupation in both groups, but this reduction is bigger in the control group.

On the other hand, the tenure function is always growing for the non-treated group when transformed contracts are considered, so that the difference with the treated group is especially significant.

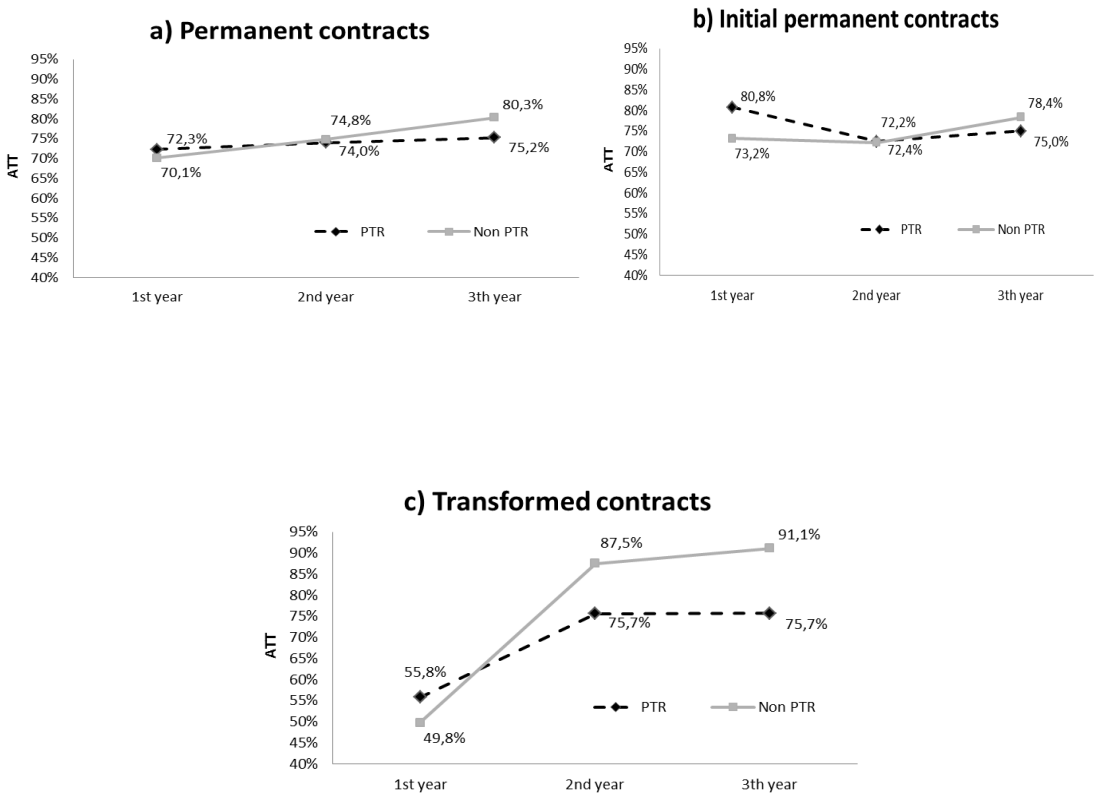
Below, Table 7 and Figure 2 show for 2003 the same procedure as it has been done before for 2002.

Table 7. Average treatment effect over time, 2003.

		PTR	Non PTR	Difference	
All contracts	1st year	72,3%	70,1%	0,0217	***
	2nd year	74,0%	74,8%	-0,0082	
	3th year	75,2%	80,3%	-0,0507	***
Initial	1st year	80,8%	73,2%	0,0760	***
	2nd year	72,4%	72,2%	0,0027	
	3th year	75,0%	78,4%	-0,0339	***
Transformed	1st year	55,8%	49,8%	0,0602	***
	2nd year	75,7%	87,5%	-0,1184	***
	3th year	75,7%	91,1%	-0,1544	***

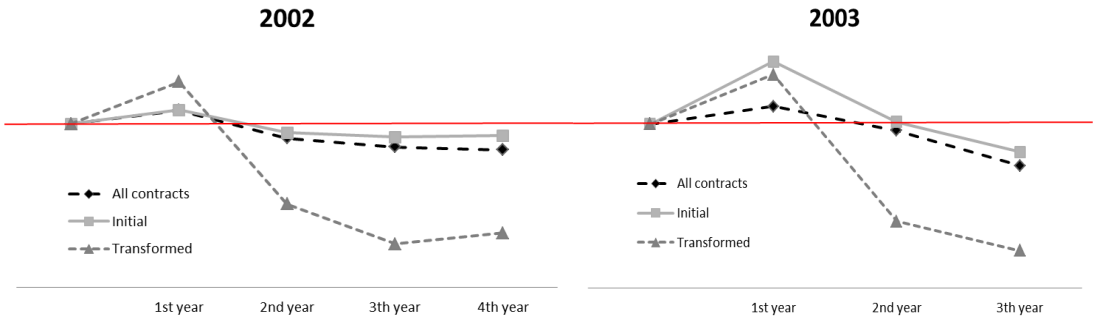
Considering the permanent contracts in the first quarter of 2003, we can also say that it is more likely to stay in the same firm for the worker if the contract is a subsidized one than in the other case only the first year. For the second and the third years the probability is higher when the contract has not PTR. The difference is again much bigger in the category of transformed contracts.

Figure 2. Average treatment effect over time, 2003.



The figures clearly suggest that workers initially associated with subsidized contracts have more stable contracts. As it has been already mentioned, the reason seems to point to the fact that there are administrative sanctions in case of not fulfilling the requirements of those contracts. This positive differential becomes negative for all other periods considered, being this difference statistically significant in all cases, falling slightly for the fourth year. This negative effect more than offsets the initial positive so that we can conclude that it is more likely that workers with subsidized contracts leave the company than workers who were taken on with other permanent contracts. Therefore, the conclusion is that companies that use these contracts show a higher propensity to fire workers, and consequently the initial effect on stability disappears.

Figure 3. Differential effects, 2002 and 2003.



In Figure 3 the differential effects between treated and non-treated groups for the three categories of contracts are shown. The difference is positive the first year and negative the next ones, both for 2002 and 2003. It is particularly striking the negative difference between the PTR and the Non-PTR contracts when only transformed contracts are considered.

To conclude this section, we can say that the response of the companies after the period during which the bonuses to security contributions are active, eliminate the positive effect found in the first year, because the survival rate of these contractual relationship is lower.

5. Conclusions.

The starting point of this study is the high rate of temporarily in contracts in the Spanish labor market after the reforms carried out to lower the large rate of unemployment observed in the 90's. In order to diminish the percentage of temporary contracts (which was 30% of the contracts in 1997), the Spanish Government began the promotion of PTR contracts that was implemented in the beginning of 2002.

In this paper we study the impact of that policy on the stability of jobs in the labor market. Similar analyses have been carried out before from the worker perspective. The main contribution of our study is, on one hand, the methodological aspect of the matching process developed in the paper; and on the other hand, the perspective adopted here: the one of the firms.

The results show clear conclusions. Whereas the probability of staying in the firm the next year is bigger for the workers whose contracts were benefited from PTR, this

probability decreases two years after and we can say that it is more likely to remain employed then if the contract has not been benefited. Thus, we raise the question that whether the policy of Payroll Taxes Reductions in contracts have been only a temporary solution to temporarily.

6. Bibliography.

Alujas, J. A. (2004): "La política de fomento del empleo: Eje fundamental de las políticas activas de mercado de trabajo en España", *Revista del Ministerio de Trabajo y Asuntos Sociales,* 51, págs. 15-30.

Heckman, J. (1979): "Sample Selection Bias as a Specification Error", *Econometrica*, 47 págs. 152-161.

Kugler, A., J. F. Jimeno y V. Hernanz (2003): "Employment Consequences of Restrictive Permanent Contracts: Evidence from Spanish Labor Market Reforms", *CEPR Discussion Paper*, 3724.

Leuven, E. y B. Sianesi (2003), PSMATHC2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing, *http://ideas.repec.org/c/boc/bocode/s432001.html.*

Malo, M. y F. Múñoz-Bullón (2006), Employment Promotion Measurement and the Quality of the Job Match for Person with Disabilities, *Hacienda Pública Española*, 179, 79-111.

Mato, F., B. Cueto y M. Dávila (2004), Evaluación de Políticas en el Mercado de Trabajo: un Análisis Aplicado a las Subvenciones de Autoempleo, *Información Comercial Española*, 813, 247-258.

Sianesi, B. (2004), An Evaluation of the Swedish System of Active Labor Market Programs in the 1990s, *Review of Economics and Statistics*, 86 (1), 133-135.